Iowa Department of Transportation
PROJECT DEVELOPMENT DIVISION - OFFICE OF MATERIALS
INSTRUCTIONAL MEMORANDUM

METHODS OF SAMPLING UNCOMPACTED HOT MIX ASPHALT (General Rewrite)

SCOPE

Two methods of sampling hot mix asphalt (HMA) are used for sampling mix to be submitted for laboratory tests. The necessary containers for Agency samples are available for purchase by the contractor from the Iowa Department of Transportation, Ames, Iowa warehouse.

REFERENCED DOCUMENTS

Standard Specification 2309 Surface Recycling by Heater Scarification
I.M. 336 Methods of Reducing Aggregate Field Samples to Test Samples
I.M. 357 Method of Preparation of Bituminous Mix Sample for Test Specimens

APPARATUS

- Metal Sampling Template, with a minimum area of 64 in.^{2} (410 cm^2) and 4 in. (100 mm) deep.
- Laboratory sampling scoop
- Putty knife
- 2 gallon (7.5 liter) capacity cardboard box (for Agency samples)
- A sampling container
- Ruler
- Jabber sampler (for thick lifts)
- Quartermaster
- Square pointed shovel

Equipment used for sampling purposes must be clean and free of any materials, which may alter the material properties of the mixture. Extra care should be used when using petroleum distillates or other solvents to clean equipment. If petroleum distillates or other solvents are used to clean equipment, the equipment must be dry prior to use.

PROCEDURE

Sample Size

Samples submitted to both laboratories for testing shall be of sufficient size to run each of the required tests (approximately 30 pounds (14 kg) for each lab). Samples taken from thick layers will be proportionately larger.

Sampling Methods

The “jabber” style sampler may be used to obtain material from the following locations or conditions: paver hopper, windrow, patching, or base widening.

> Note: Extreme care shall be taken to minimize segregation of coarse and fine particles while the sample is being taken.
> Note: Extreme care shall be taken so as not to contaminate the sample with any foreign matter (Fuel oil, dust, etc.).

A. Pavement Sampling

This method of sampling hot mix asphalt is not to be used in situations involving Heater Scarification Work as stated in Standard Specification 2309.

1. Samples shall always be taken behind the laydown machine before the material receives any compaction. Sampling shall be distributed over at least 30 tons (30 Mg) of mix placed (approximately two different truckloads).

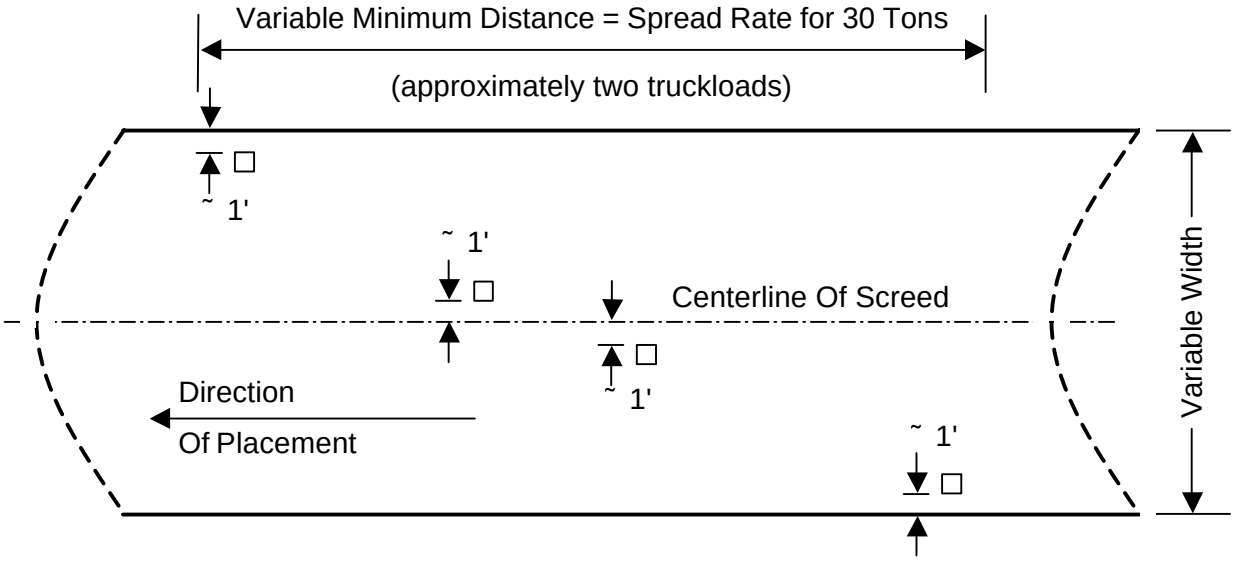
2. The template shall be placed on the mat and forced straight down through the entire depth of the mat being laid. All material inside the template shall be scooped out and placed uniformly in the sample container(s). A square pointed shovel may be used to take the sample from the inside of the template. A scoop can be used to remove the excess material from along the inside of the template. All the material, which has stuck to both the inside and outside of the scoop, shall be scraped off and added to the sample. The engineer may adjust the details of this procedure when samples are obtained from courses placed on earth subgrades and untreated subbases and bases to prevent contamination.

   > Note: Any material adhering to the inside of the template shall be scraped off and added to each template sample.

3. Samples shall be taken to represent a cross section of the mat as follows:

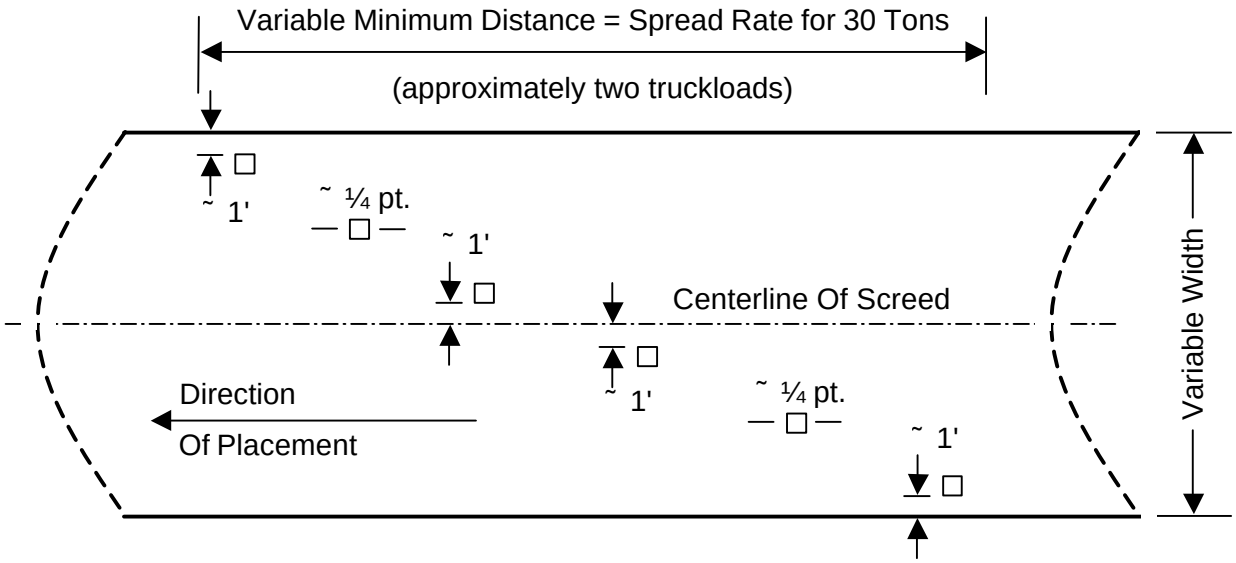
   a. A minimum of four template samples shall be taken. On approximately 1 foot (0.30 meters) in from the left edge of the mat, one approximately 1 foot (0.30 meters) left of the center of the screed, one approximately 1 foot (0.30 meters) right of the center of the screed, and one approximately 1 foot (0.30 meters) in from the right edge of the mat. (See diagram 1.)

SAMPLING DIAGRAM 1



b. If six template samples are needed to yield a sample of sufficient size, an additional template sample shall be taken approximately on each quarter point. (See diagram 2.) If eight or more template samples are needed to yield a sample of sufficient size, two or more repetitions of four or six template samples may be required.

SAMPLING DIAGRAM 2



4. When sampling from thick lifts (generally greater than 3 inches (80 mm) in thickness), obtain the sample in increments as outlined above except a metal straight edge or a square point shovel may be used to delineate the sample sites in lieu of the template. The square pointed shovel may be used in place of the sampling scoop to remove the sample. If the four segments required by 3a result in excess mixture, the additional mixture shall be forwarded to the appropriate laboratory. Large samples shall be carefully combined and reduced at the laboratory prior to testing.

B. Hopper Sampling

This method of sampling hot mix asphalt shall be limited to projects using the Heater Scarification Process as stated in Standard Specification 2309.

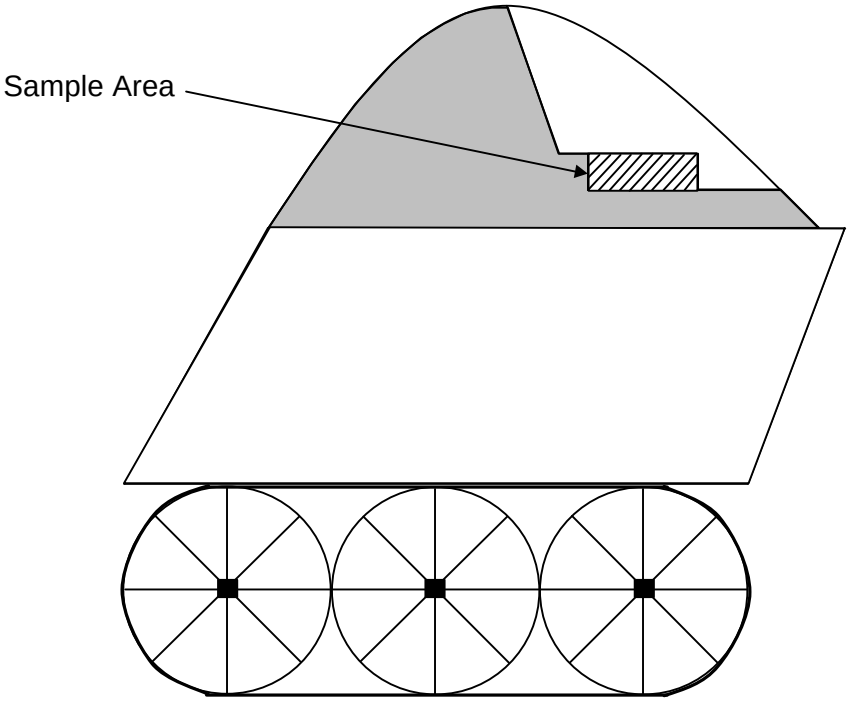
1. The sample shall always be taken from the paver hopper.

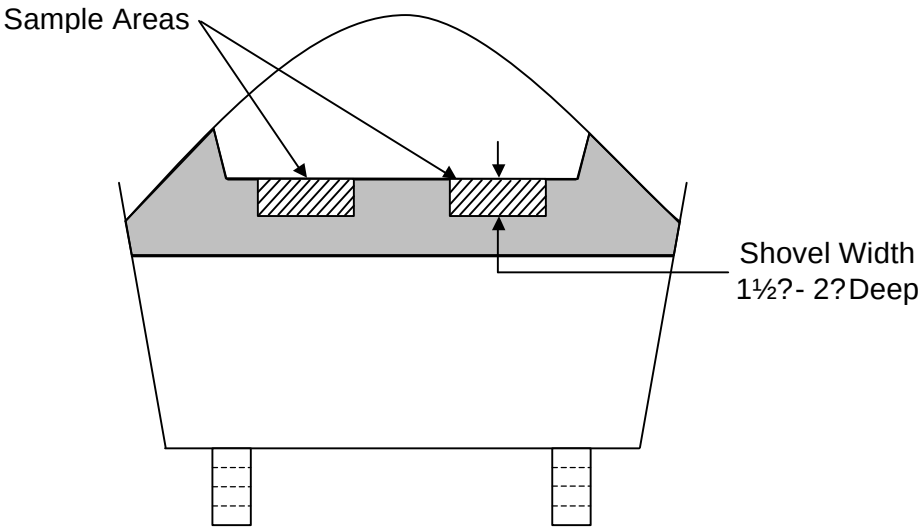
2. A square pointed shovel shall be used to prepare the sampling area and to take the sample.

3. The sample shall be built up from a minimum of 30 tons (30 Mg) of mixture placed (approximately two different truckloads).

4. The sample shall be taken from a location, which is as near the center of the mass of a nearly full hopper as practically possible. A flat surface shall be prepared by

removing mix downward from the peak until the desired plateau is reached. Just prior to taking the sample, all foreign material shall be scraped from the shovel. The sample shall be removed from the plateau in a manner that will assure collection of material over an area, which is of uniform dimension. In placing material into the box, the material from the front face of the shovel shall be included.





Sample Splitting

These splitting methods are to be used for reducing field samples to lab sample size. To reduce samples to test sample size see I.M. 357.

The order of preference of sample splitting is as follows:

A. Quartermaster (or similar quartering device)

1. Place the entire sample (60 pound minimum) in the Quartermaster.

   > Note: Take care to avoid segregation when placing material in the Quartermaster.

2. Release the gate to split the sample into four smaller samples.

3. Take the split material from opposite corners and recombine to obtain two boxes of material.

B. Field Splitting (Side-by-side Sampling)

This method of splitting is only to be used when sampling directly from the pavement.

1. The Contractor shall obtain HMA samples in accordance with the procedures outlined above except that, two boxes of at least 30 pounds (14 kg) each shall be obtained from each sample site.

2. After obtaining each template sample for the first box, the template shall be moved longitudinally so that the second template sample site shares a common edge with the first.

3. Perform the same procedures as stated above to remove all material from the adjacent location and place this material in the second box.

C. Riffle Splitter

Follow procedure I, Splitting Method, in I.M. 336 with the following exceptions:

1. Only one cycle of this process is performed to obtain the desired sample size for both labs.

D. Manual Splitting

Follow procedure IV, Quartering Method, in I.M. 336 with the following exceptions:

1. Only one cycle of this process is performed to obtain the desired sample size for both labs.

Sample Delivery & Retention

1. Each Sample shall be carefully labeled.

2. Transport both boxes to the Contractor's QMA laboratory.

3. The Contractor's certified technician will select one box to retain at the Contractor's QMA laboratory for testing.

4. The second box will be retained at the Contractor's QMA laboratory for testing by the Contracting Authority. Samples submitted to the Contracting Authority must be accompanied by a completed Form #193.

5. The Contractor shall retain all samples for a lot until the lot is accepted by the Contracting Authority.

> Note: The Contractor should retain all samples until notified by the Contracting Authority that the material is no longer required.